



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3029 Product Size: NPS 24 STD Production Date: Jan 25, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003134
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N/X46N PSL2, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B/C NDE, AS3-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015
 Product Markings: <API & L/C No.> API SPEC 5L NPS 24 STD 0.375 INCHWT GR BN/X42N/X46N PSL2 SM1S 2017/01 NDE 1300PSI
 HEAT BSM-3029 (PIPE # LENGTH MASS) 94.76lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA



| Product: Details | | | | Non-Destructive Testing | | | | | | | | | | |
|------------------|-----------|------------------------|--------|-------------------------|------------|--------------|-----------------|--------------|------|---------|------------|----|-----------|---------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass lb/ft | Gelger µR/hr | Res. Mag. Gauss | Visual Insp. | OD | UT (WT) | UT | ET | HydroTest | End Condition |
| BSM-3029 | Heat | NPS 24 STD 0.375in. WT | 9 | DRL | 94.76 | <5 | <10 | Pass | Pass | Pass | N12.5 Pass | - | Pass | 35° Bevel |

| Heat | BSM-3029 | Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCO China) | Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | |
|------|----------|---|-------------------------|---------|-------|-------|-------|-------|------|------|------|-------|-------|-------|--------|-------|--------|---------|-------------|---------|
| | | | Test Type | | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE(IIW) | CE(IIW)/Max | CE(CSA) |
| | | | Heat | Product | 0.15 | 1.06 | 0.014 | 0.003 | 0.25 | 0.06 | 0.01 | 0.01 | 0.01 | 0.038 | 0.002 | 0.002 | 0.0005 | 0.35 | - | 0.34 |
| | | | 0.16 | 1.08 | 0.011 | 0.002 | 0.26 | 0.06 | 0.02 | 0.01 | 0.01 | 0.041 | 0.002 | 0.001 | 0.0004 | 0.36 | 0.43 | 0.36 | | |
| | | | 0.16 | 1.08 | 0.011 | 0.002 | 0.26 | 0.06 | 0.02 | 0.01 | 0.01 | 0.041 | 0.002 | 0.001 | 0.0004 | 0.36 | 0.43 | 0.36 | | |

| Mechanical Properties | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|--|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| BSM-3029 | Heat | Ferrite & Pearlite | 78 HRBW | Pass | Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT | 50 500 49 900 | 72 500 73 000 | 0.70 0.68 | 44 42 |

| Heat | Test Standard | Result | Impact Test Sample Details | Temp °C | Impact Energy Min. (J) | | Shear (%) | | Lateral Expansion (mm) |
|----------|---------------|--------|----------------------------|---------|------------------------|-------------------|-------------------|-----------------------|------------------------|
| | | | | | (3 Tests) AVG | (3 Tests) AVG | (3 Tests) AVG | (3 Tests) AVG | |
| BSM-3029 | ASTM A333 | Pass | CVN Long 10 x 7.5 mm | -48 | (11/11/11) 14 | (174/188/180) 181 | (100/100/100) 100 | (2.23/UNB/2.25) 2.24 | |
| BSM-3029 | API 5L PSL2 | Pass | CVN Trans 10 x 7.5 mm | 0 | (15/15/15) 20 | (116/112/126) 118 | (80/80/80) 80 | (2.01/1.91/1.96) 1.96 | |

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with API 5L-45th Ed., N ASTM/ASME A333-2016/SA333-2015, A106-2014/SA106-2015, AS3-2012/SA53-2015, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 (APIQR-1584), API Q1, and PED 2014/68/EU.

Mill Test Certificate approved by:

✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103/ISO 17495:2015 Section 13.1

✓ No weld repairs have been performed on this product.

✓ This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.

✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager

T. Lam Feb 10 1 2017